CURRICULUM VITAE – QIANQIAN ZHANG

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🎓 Education

PhD: Integrated Master's and Doctoral Program
Advisor: Junshe An
6 patents, 1 SCI publication, 2 conference papers (1 EI, 1 Best Paper), 1 national competition
2024 – Present

Research Visit 1 during PhD
Tsinghua University AIR, Vision Large Model Efficient Inference Group
Advisor: Yunxin Liu
Jun 2024 – Jan 2025

Research Visit 2 during PhD
Sponsored by China Scholarship Council (CSC)
Queen Mary University of London, Edge Deployment of Vision Large Models
Advisor: Ahmed Sayed
Sep 2025 – Mar 2026

Master: University of Chinese Academy of Sciences (NSSC)
Advisor: Li Zhou
Computer Application Technology, GPA 3.7/4.0
Sep 2021 – Feb 2024

Bachelor: Hefei University of Technology
Electronic Information Science and Technology
Advisor: Chunhua Li
Average Score 92.274, Top-ranked Graduation Project
Sep 2017 – Jun 2021

Relevant Experience

Mathematical Theory Learning Experience

[Advanced Mathematics] (99/100), **[Linear Algebra]** (92/100), **[Probability Theory]** (95/100)

Reinforcement Learning, AI Deep Learning Principles, and Computer Object Detection Theory Learning Experience

[Computer Architecture] - under the tutelage of Weiwu Hu from Loongson (91/100),
[Intelligent Computing System] - under the tutelage of Yunji Chen from Cambricon (94/100),
[Brain Cognitive Mechanism and Computational Model (Vision)] - under the tutelage of Peng Zhang from the Institute of Biology, Chinese Academy of Sciences (93/100),
[System-on-Chip Design in the Big Data Era] - under the tutelage of Chunzhang Chen from Pengcheng Laboratory (90/100),
[Image Processing] - under the tutelage of Weiqiang Wang from the Institute of Computing Technology,
[Advanced Artificial Intelligence](Principles of Artificial Intelligence and Reinforcement Learning) - under the tutelage of Huawei Shen, Ping Luo and Gaowei Wu from the Institute of Computing Technology,
[Computer Algorithm Design and Analysis] - under the tutelage of Dongbo Bu from the Institute of Computing Technology,
[Advanced Computer Architecture (GPU)] - under the tutelage of Haihua Shen from the University of Chinese Academy of Sciences,

[Programming and Algorithm Training](Excellent),
[Electronic Design Training](Excellent),
[Digital Circuit Course Design](Excellent),
[Analog Circuit Course Design (EDA)] (Excellent)

Professional Experience in PyTorch, Computer Vision, Video, and Multimodal Applications

- **Video Compression 1 excellent conference paper, 2 invention patents (first author)** Sep 2022–Jun 2023
  - Patent: Space-based heterogeneous H.264 video encoding system and method (Granted)
  - Patent: Space-based heterogeneous H.264 video decoding system and method (Under first review)
  - Conference Paper: *Design of H.264 Video Compression System Based on Domestic CPU+GPU*
- **Small Object Detection 1 SCI paper, 1 invention patent (first author)** Jul 2023–Feb 2024
  - Sensors'24 SCI Paper: *Real-Time Recognition Algorithm of Small Target for UAV Infrared Detection*
  - Patent: Real-time small target recognition method and system for UAV infrared detection (Granted)
- **Multispectral Modality Fusion 3 invention patents, 1 international conference paper (first author)** Feb 2024–Jul 2025
  - ACCV'24 Paper: *ESM-YOLO: Enhanced Small Target Detection Based on Visible and Infrared Multi-modal Fusion*
  - Patent: Small target detection system via visible and infrared multimodal fusion (Granted)
  - Patent: Pixel-level multispectral fusion small target detection system using mask enhancement (Granted)
  - Patent: Infrared small target detection system improved with visual state-space model (Granted)
- **PaddlePaddle Development** Feb 2023–Aug 2023
  - National Third Prize (7th IC Innovation Contest - Graduate Track): Served as team leader. Worked on cloud FPGA debugging, PaddlePaddle deployment, and video stream object detection.
  - Image Classification: Improved MobileNetV2 (72% accuracy, Naval Competition)
  - Small Object Detection: MobileNetV1 / YOLOv3-MobileNetV1 / PicoDet (Detection accuracy >90% for small targets)
- **PyTorch & TensorFlow** Sep 2023–Feb 2024
  - Worked on Chinese Academy of Sciences project: *Geomagnetic Storm Bayesian Deep Learning Model – Forecasting Dst Index*. Task: Porting TensorFlow code to domestic Loongson 3A6000 CPU.
  - Performance comparison across platforms (AMD/Intel/Domestic CPU)
  - PyTorch FFT time comparison (Loongson vs AMD)
  - Wrote a 50-page manual on porting error solutions
- **Deep Learning Algorithms** Sep 2021–Sep 2022
  - Certified Cambricon Best Developer. Scored full marks in 15 deep learning experiments during graduate study at UCAS. Familiar with Cambricon cloud platform development.
- **Model Lightweight Deployment** Nov 2023–Feb 2024
  - Contributed to a 42-page / 20k-word grant proposal
  - Quantization and pruning for MobileNetV1: 21.3MB $\rightarrow$ 3.64MB (19.3% parameter reduction)

Academic Exchange & Activities

- **Excellent Paper Award (first author)**, 35th National Conference on Space Exploration 2023
- **Technical Exchange Presentation**, China Aerospace Science & Industry Corp (CASIC) 2nd Academy
  - Topic: Infrared Dim & Small Target Detection Technologies
  - Conducted comprehensive review of 120+ research papers
  - Prepared and delivered 47-page technical presentation
- **Invited Speaker**, Jichuang Star Youth Forum (Chongqing, Hybrid)
  - Presented: "Research on Detection Model Compression for Hardware Heterogeneous Deployment"
- **Summer Programs & Workshops**
  - International Meridian Circle Summer School 2023
  - IEEE GRSS (Geoscience & Remote Sensing Society) Summer School 2024
  - Tsinghua AIR (Institute for AI Research) Summer Camp 2024
- **Industry Conferences & Workshops**
  - Microsoft Ada Workshop 2024, 2025
  - Baidu Large Language Model Tech Conference (Baidu HQ) 2024
- **International Programs**
  - Zhongguancun Forum 2024
  - International Meridian Circle Big Science Program (Chengdu, Daocheng) 2025
  - 2nd Belt and Road Initiative Sci-Tech Exchange Conference (Chengdu) 2025

Internship Experience

- International Meridian Circle Program Office 2023
  - Assisted in organizing the International Meridian Circle Forum, Yanqi Youth Forum, and "Belt and Road" Space Weather Training Program at Huairou Science City headquarters
  - **Media coverage:** China News, Global Network, Guangming Daily, Xinhua News
  - **Achievement:** Outstanding Intern
- International Space Science Institute Office 2024
  - Supported project advancement and facilitated international collaboration
  - Assisted in organizing the international conference "Detecting Earth-like Planets in the Universe"
  - Gained comprehensive understanding of scientific project progress
  - Collaborated effectively with leading researchers in space science
  - **Achievement:** Outstanding Intern
- International Meridian Circle Program Office Mar 12 - Jun 15, 2025
  - Assisted in organizing conference series for the International Meridian Circle Program in Chengdu, Sichuan
  - Coordinated visits to the "Thousand-Eye Sky Pearl" national major scientific infrastructure
  - 1) Participated in organizing the International Big Science Program Forum at the 2nd Belt and Road Sci-Tech Exchange Conference
  - **Host organizations:** Ministry of Science and Technology, CAS, CAE, NSFC, China Association for Science and Technology, Sichuan Provincial Government, Chongqing Municipal Government
  - 2) Assisted in preparing IMCP parallel forum
  - 3) Coordinated IMCP thematic conference logistics
  - 4) Organized visits to the Daocheng Yading Radio Heliograph on the Qinghai-Tibet Plateau
  - **Achievement:** Outstanding Intern
- Zhuhai Municipal Government 2025
  - Worked at Zhuhai Municipal Administration of Government Services and Data, and 12345 Hotline Center

  - Proposed improvement plans for government affairs large models, multimodality, and domestic edge deployment
  - Selection rate: 6/100 (University of Chinese Academy of Sciences)
  - **Achievement:** Received Letter of Appreciation from Zhuhai authorities

Robot Control Competition Experiences

- **National Third Prize and North China Region First Prize (Team Leader)**
  7th Integrated Circuit Innovation and Entrepreneurship Competition (Master's and Doctoral Track)
  Responsibilities: Cloud FPGA remote debugging, domestic PaddlePaddle framework development and deployment, small target detection in video streams, model quantization, pruning, and distillation
  Date: August 2023
- **Provincial Project (Host)**
  "*Intelligent Wheelchair Based on Mecanum Wheel and LPC54606 Chip Control*"
  Project Achievements: 1 paper published in a national journal, 1 provincial award
  Date: 2019
- **Provincial First Prize (co - first author)**
  14th Anhui Provincial University Student Electronic Design Contest
  Topic: Electromagnetic Deflection Cannon
  Date: October 2019
- **Provincial Second Prize (Team Leader)**
  Anhui Provincial Robot Contest - Microcontroller and Embedded System Category
  Platform: A-platform 51 Microcontroller
  Date: May 2018
- **Provincial Second Prize (Team Leader)**
  13th iCAN International Innovation and Entrepreneurship Contest - Anhui Region
  Project: Smart Lock Based on 51 Microcontroller - "Removing Input Devices"
  Date: September 2019
- **School Silver Award (Team Leader)**
  5th Internet+ Innovation and Entrepreneurship Contest
  Project: A New Generation of Unmanned Supermarket System with Automatic Stock Allocation
  Date: August 2019
- **School Second Prize (Individual Contestant)**
  University Student Physics Academic Contest
  Date: December 2019

Team Collaboration Experience

- Served as team leader and first author for all competitions, papers, and patents during my master's and doctoral studies, collaborating harmoniously with various supervisors.
- Received honors such as Excellent Student Cadre (twice) and Meritorious Student from the University of Chinese Academy of Sciences.
- Led all competitions and projects during my undergraduate studies, functioning as team captain and maintaining positive relationships with diverse team members.
- Awarded Meritorious Student for three consecutive years, Technology Activity Award for three years, Star of Scientific and Technological Innovation (top 1%) for three years, served as Student Leader of the Undergraduate Electronic Innovation Laboratory and Deputy Class Monitor.

Other Activities

- Contributed one artwork to the Third International Academic Forum on "The Intersection of Art and Science" and Excellent Student Works Exhibition. Participating institutions included the Central Academy of Fine Arts, Tsinghua University, Peking University, etc. Media support included People's Daily Online, People's Art Online, Tencent, and others.
- Participated in the "Marching into the New Era" Achievements Exhibition and cooperated with reporters from Xinhua Daily and Jiangsu Broadcasting Corporation.

- Took part in the taping of CCTV's "Open Talk" program hosted by Sa Beining.
- Served as a student judge for the evaluation of the Graduate National Scholarship and Zhu Li Yuehua Scholarship at the National Space Science Center of the Chinese Academy of Sciences in 2024.

Publications & Achievements

[Published Papers, First Author]

- **[ACCV'24]** "ESM-YOLO: Enhanced Small Target Detection Based on Visible and Infrared Multi-modal Fusion" **Qianqian Zhang**, Linwei Qiu, Li Zhou, and Junshe An. In Proceedings of the Asian Conference on Computer Vision (ACCV), 2024, pp. 1454-1469
- **[Sensors'24]** "Real-Time Recognition Algorithm of Small Target for UAV Infrared Detection" **Qianqian Zhang**, Li Zhou, and Junshe An. Sensors, 24, 3075. https://doi.org/10.3390/s24103075

[Invention Patents, First Inventor, all with first-instance responses submitted, 5 authorized]

- **[1]** Patent Title: A Satellite-borne Heterogeneous H.264 Video Compression Encoding System and Method Public No.: CN 116527895 A; Publication Date: 2023-08-01; Inventors: **Qianqian Zhang**, Li Zhou, Junshe An [Authorized]
- **[2]** Patent Title: A Satellite-borne Heterogeneous H.264 Video Compression Decoding System and Method Public No.: CN 116527896 A; Publication Date: 2023-08-01; Inventors: **Qianqian Zhang**, Li Zhou, Junshe An
- **[3]** Patent Title: A Small Target Detection Method and System Based on Visible and Infrared Multi-modal Fusion Public No.: CN 118470557 A; Publication Date: 2024-08-09; Inventors: **Qianqian Zhang**, Li Zhou, Junshe An [Authorized]
- **[4]** Patent Title: A Real-time Recognition Method and System for Small Targets in UAV Infrared Detection Public No.: CN 118314477 A; Publication Date: 2024-07-09; Inventors: **Qianqian Zhang**, Li Zhou, Junshe An [Authorized]
- **[5]** Patent Title: A Pixel-level Multispectral Fusion Small Target Detection Method and System Based on Mask Enhancement Public No.: CN 119810601 A; Publication Date: 2025-04-11; Inventors: **Qianqian Zhang**, Li Zhou, Junshe An [Authorized]
- **[6]** Patent Title: An Improved Infrared Small Target Detection Method and System Based on Visual State Space Model Public No.: CN 119810681 A; Publication Date: 2025-04-11; Inventors: **Qianqian Zhang**, Li Zhou, Junshe An [Authorized]

[Submitted/In Preparation]

- Zhang Q, Wang W J, Liu Y, et al. Selective Structured State Space for Multispectral-fused Small Target Detection[J]. arXiv preprint arXiv:2505.14043, 2025.
- Extended version of ACCV24 conference paper with 50% new content, to be submitted soon.